De praehistorische mens en zijn milieu

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SUMMARY

Prehistoric man and his environment.

A palynological study about the influence of man on the vegetation of the diluvial soils of the Netherlands [1].

The object of the investigation was to obtain data about the influence of prehistoric man on the vegetation of diluvial soils of the Netherlands. Some pollen diagrams and a great number of spectra from fossil humus layers underneath burial mounds served as a basis for this study.

After a survey of the history of the vegetation (Chapter II), which is linked as closely as possible with the zoning established by FIRBAS, the principal prehistoric cultures are briefly dealt with (Chapter III).

The methods of the palynological investigation of burial mounds are discussed in Chapter IV. When sampling these tumuli a full understanding of the often complicated stratigraphy of the burial mounds is necessary. Sampling along radial profiles is desirable. Those places ought to be searched for where the original soil profile has remained undisturbed. Such places occur for instance adjacent to graves, where part of the soil that was dug out, was left behind after the coffin had been covered.

The uppermost centimeter of the fossil soil profile has always been sampled; it represents the original humus layer. At times this layer is clearly marked off, but at other times decomposition after the mound had been thrown up, has still continued to such an extent that separation of the old surface from the main body of the mound causes difficulties. The samples contain the pollen deposits of some scores of years and are in this respect comparable with normal peat or gyttja samples.

The body of the mound has practically always been built up of overturned sods, which were cut in the vicinity and so correspond with the upper part of the fossil soil profile.

Occasionally the sods are rather more humic than the old surface; presumably they have then been cut from places which were more humid. Sod samples, provided that they are correctly taken, are also suitable for the investigation. They have preference when the old surface is much disturbed, or – in the case of mounds built over the remains of a funeral pyre – where the pollen in it has been destroyed.

In early, that is neolithic tumuli, the humosity of the sub-soil and the sods can be so slight, that they are practically indistinguishable.

[1] The writer is indebted to Mr J. D. Emeis and Mr R. W. Pooley for translating this summary.

Though in such cases the sod structure is seemingly absent, a comparison with the deeper sub-soil shows, that the material of the mound comes from the upper part of the soil profile.

Finally, the humic parts of the natural infilling of circular ditches are considered for sampling. However, the danger of contamination is great with such samples.

The preservation of pollen (Chapter V) in samples of burial mounds is always poorer than in peat or gyttja. The darker, that is the more humic the sample appears, the better the pollen is preserved. In yellow sandy samples without a visible humus content, the determination gives great difficulties.

Practically all the common pollen and spore types could be recognized, even the thin walled Salix, Fraxinus and Rumex. The poor preservation is shown by corrosion of the exine as well as by crumpling. For types the recognizability was not or practically not affected, for instance: Tilia, Alnus, Plantago, Compositae and Gramineae. With others such as Quercus, Ulmus, Fraxinus, Rumex the recognizability was affected and in these cases the pollen percentages could be somewhat too low. The Cyperaceae could not be recognized at all.

The high values of Dryopteris and Sphagnum in the spectra of the early mounds may be caused by the very strong resistance of the spore wall. Apart from this no indications for selective preservation were obtained.

The quantity of pollen in the samples was usually very high. Chemical treatment did not give any particular difficulties. The humus colloids around the quartz grains dissolved with caustic potash freeing the pollen grains and spores. The mineral parts were removed by decanting, if need be followed by treatment with hydrofluoric acid or a mixture of alcohol and bromoform (S.G. 2.2).

The effect in the pollen diagrams of the influence of neolithic man on the vegetation is discussed in Chapter VI. In the next chapter the different areas investigated are described. The spectra obtained are combined into tables 2–12. In addition to the pollen and spore percentages the supposed age of the barrow is indicated as well as the kind of sample [1]. The results of the barrow investigations are given in Chapter VIII. They will be summarized below.

The Late-Glacial (Upper Palaeolithic)

The late-glacial tundra must have been a rather favourable environment for man because of its great wealth of game and a luxuriant vegetation. The oldest cultural remains belong to the Hamburg Culture. As a result of the researches of Rust and Schütrumpf it can be accepted that they are older than the Allerød oscillation. They consist of flint artifacts found at a great number of localities. In this

[1] Translation of some dutch terms used in the tables: oud oppervlak = old surface; plag = sod; cultuurgrond = arable soil; stuifzand = dune sand; ringsloot, kringgreppel = ditch; graf = grave; vroeg = early; laat = late; Bronstijd = Bronze Age; yzertijd = Iron Age.

country these have never been found as yet in sediments containing pollen. The influence of the small communities of Reindeer hunters on the tundra vegetation has certainly been negligible.

VAN DER HAMMEN examined a lake deposit near Usselo, located next to a settlement of another palaeolithic culture, namely the Tjonger Group. The culture layer of Usselo lies within a coversand. A thin charcoal layer could be followed into the lake deposits and belongs to the commencement of the Younger Dryas-time. This level, regarded by VAN DER HAMMEN to be synchronous with the culture, can according to the writer only be regarded as indicating the minimum age. The Tjonger Group is represented at a great number of localities in our country. SCHWABEDISSEN regards this culture as a part of the Federmesser-civilization. It belongs to the Magdalenian.

This so-called Usselo layer is very common in coversand deposits. Sometimes it is developed as a peat, elsewhere it forms part of the soil profile. Usually leaching and washing-inlayers are clearly discernible. Near Een these layers – with artifacts of the Tjonger Culture – were developed as a clear podsol profile with iron pan. This points to a wet climate during the Allerød time, which is in agreement with VAN DER HAMMEN's results.

The diagram of a lake profile in the vicinity of Assen (Fig. 14) supports VAN DER HAMMEN's opinion that in the Allerød time the „perenne tjäle" disappeared temporarily. Over the entire floor of the former lake a thin layer of irreversibly dried gyttja was found, which was covered by a normal gyttja deposit. It appears from the diagram that the lower gyttja was formed in the first half of the Allerød oscillation, while the upper one dates from the Younger Dryas-time. The Pinus phase of the Allerød oscillation is missing. The sudden drying up of the lake in this time can only be the result of the falling off of the tjäle. Evidently the latter was formed again in the Younger Dryas-time.

Though the sediments examined by VAN DER HAMMEN were only a few meters from the settlement, no trace of human influence on the vegetation could be established, apart from fluctuations in the curves of Pinus and Betula, which VAN DER HAMMEN associated with bushfires. The bushfires, however, could have had a natural origin.

For the Ahrensburger Reindeer Hunter culture, which according to RUST and SCHÜTRUMPF belongs to the Younger Dryas-time, only one site has been found as yet in our country. The extensive sand-drifts during the development of the Younger Coversand may have formed an obstruction to man.

The Preboreal, Boreal and Atlantic (Mesolithic)

The zoning of FIRBAS for these periods was adopted, except for the subdivision of the Atlantic.

Of the sporadically represented Tardenoisian I (Kirchdorfer Stufe according to SCHWABEDISSEN) no site has been identified as yet by means of palynology.

At the margin of a vast lowland filled with peat, in the vicinity of Haule, a large site of the Tardenoisian II (Halterner Stufe) was

unearthed. The culture-layer with artifacts continued into the fringing zone of peat and could thus be dated at the transition period of Boreal to Atlantic. The climate was fairly warm, as is evident from the presence of Viscum. The occurrence of the pollen of Jasione and Rumex points perhaps to an open, thin character of the forest in the environment of the settlement. Only a few grains of Chenopodiaceae were found (fig. 15).

Sites of the Tardenoisian III are very numerous. Practically all of them are located on the coversand ridges along the brooks or round about the peat-moors, where the forest was thinner than on the fertile soils. From the results obtained near Haule it can be accepted that this culture falls within the Atlantic.

The values of Chenopodiaceae are practically nil in Boreal and early Atlantic sediments. However, in the second half of the Atlantic on several pollen diagrams there is a distinct increase up to about 1%. With regard to the diagram of Havelte-Witteveen, it is clear that this must be connected with the intensive Tardenoisian III habitation around this peat-moor. The very sporadic occurrence of Plantago major, Plantago lanceolata and Rumex in the diagram of Spier can possibly also be connected with the mesolithic cultures (figs 18, 19).

Consequently there are some data pointing to small clearings near the settlements. The main forest, however, remained untouched and there were no heathlands as yet. From the occurrence of Viscum and the high values of Tilia it must be accepted that the climate was warmer than at present. The values of Ulmus are lower than in the surrounding countries, probably as a result of the low fertility of the soil.

The Subboreal (Neolithic and Bronze Age)

Compared with the Atlantic the Subboreal is characterized by lower values of Ulmus and Tilia, however, without any sharp break between them. During the whole period Fagus is present, but initially with such low values, that only by counting large numbers of pollen grains per sample can a continuous curve be obtained. The close of the period is defined by a strong decrease of Corylus, the disappearance of Tilia everywhere and an increase of Fagus.

Connected with the presence of favourable areas for growth, there occur local differences in the absolute values of Fagus. The values of Tilia are lower in the northern part of the country, probably due to a cooler climate prevailing there.

In this period occur the first neolithic cultures. Three civilizations play a part in the investigated region: the Passage Grave, the Bell-beaker and the Single Grave culture. The first is only present in the North, the second mainly in the centre (the Veluwe) and the third throughout the whole country.

In the diagrams made for some small peat-moors, located at short distances from burial mounds and megalithic tombs at Havelte and Spier (figs 18, 19) a maximum was found of Plantago lanceolata, Rumex, Gramineae, Calluna and Dryopteris. From this it can be presumed,

that man interfered with the natural landscape in a way similar to that found by IVERSEN in Denmark. The lack of changes in the values of the treepollen, pointing to regeneration of the forest, can be the result of infertile soils. The „landnam" phase in the diagrams represents a longer period than in most of the profiles of IVERSEN. Resemblances should be sought in those of his profiles where a series of successive clearances was observed. The examination of the burial mounds has made it apparent that the Single Grave culture was responsible for this „landnam" for the following reasons:

a. The mounds of the Single Grave culture investigated – also those in the vicinity of Havelte and Spier – yielded spectra with very high values for Plantago lanceolata (till 89%), Rumex (till 13%), Gramineae (till 69%), Dryopteris and many other herbs, while the values of Calluna were relatively low.

b. Passage Grave mounds on the contrary yielded spectra, in which Plantago and Rumex played an unimportant role. Gramineae, Pteridium and Calluna dominate the herbs.

c. Finally in regions where Passage Graves are lacking entirely, such „landnam" spectra have been found.

It must be mentioned that sufficient data for the Bell-beaker culture could not be collected.

The values of the treepollen of the said spectra allowed a correlation with the Plantago maximum in the pollen diagrams to be fixed.

According to IVERSEN the megalith culture should have caused the high Plantago values. It should be remembered, however, that the earliest phases of this culture (the „dolmens") are lacking in the Netherlands, while little is known as yet of the influence of the Single Grave culture on the landscape in the heaths regions of Jutland.

From what has been said above, it follows that the influence of the Passage Grave culture should have been of a much more local character, than that of the Single Grave culture. This is entirely in agreement with the supposed settled and nomadic character of these cultures respectively.

Soon after the first colonization and the appearance of the pioneer vegetation discussed above, Calluna spread. This appears from a comparison of the spectra from different mounds in one area. The expansion took place at the expense of Plantago and the other herbs and continued during the Bronze Age.

The deforestation in the Neolithic created the first condition for the coming into existence of vast heaths. The second condition was the increasing humidity. This shows up for instance in the strong increase of the Sphagnum peat in the bogs and in the sudden appearance of the heather profile at the beginning of the Bronze Age. VAN GIFFEN long ago pointed out that this profile is always missing below neolithic barrows. The palynological investigation of burial mounds showed that the increase of podsolization is independent from the extent of the heather cover, as appears from the Calluna percentages. In regions which became intensively inhabitated at an early date, values

occur during the Neolithic which elsewhere were found only in the Bronze Age.

In the Late Bronze Age the pollen of Spergula and Spergularia appear for the first time. These types, together with Chenopodiaceae, Polygonum Persicaria-type and many other herbs, were found abundantly with a group of tumuli located in old arable land at Oudemolen. Probably the same crops were grown here which, according to the investigations of JESSEN and BRANDT, might have formed part of the human diet in the Early Iron Age.

Comparing the burial mound spectra with the pollen diagrams it appears that the Bronze Age coincides approximately with the forming of the Older Sphagnum peat.

The Subatlantic (Iron Age)

The Subatlantic period is characterized by the increase of Fagus and Carpinus and the absence of Tilia. The Younger Sphagnum peat in most of the pollen diagrams of the Netherlands comprises only a part of this period, i.e. from about 400 A.D. This appears from the following considerations:

a. The values of Fagus are lower in the spectra of the Iron Age burial mounds than in the Younger Sphagnum peat.

b. Carpinus is practically completely missing in these mounds, but is always present in the Younger Sphagnum peat.

c. Some peat profiles near Zeijen, dated by findings from the 4th century A.D., show a normal development of the vegetation of the Younger Sphagnum peat.

d. The values of the Cerealia in the Younger Sphagnum peat are usually so high that Secale must be partly responsible. This cereal species appears only in the early centuries of our era.

As the Older Sphagnum peat in the area investigated in most cases appears to be of Subboreal age, there has been a period without peat growth. This dry period comprises the Iron Age, and not, as WEBER originally assumed, the Bronze Age. As in most pollen diagrams the so called Grenzhorizont is placed at a level, which, according to the foregoing has to be dated at about 400 A.D., it must be concluded, that the Grenzhorizont is not Recurrence Surface III, as hitherto generally believed, but RS II. This is also true in cases, where, like in OVERBECK's profiles from Gifhorn, no indications have been found for any major interruptions of the bog growth and Sphagnum peat formation has continued during the early Subatlantic. The well known C_{14}-dating of the Melbeck profile supports our view (see p. 11).

The increased humidity is also shown by the intensive podsolization which took place after Roman times. The sand dunes which came into existence in the early Iron Age became again covered with heath.